

What Is Claimed Is:

1. A method of finishing a silicon part using (1) a rotatable grinding wheel having diamond particles and a bonding agent, and (2) using one or more grit materials, the method comprising:

5 (a) dressing the rotatable grinding wheel to form a wheel with a grinding surface having a plurality of diamond particles forming a substantially uniform diamond particle grinding diameter;

(b) thereafter removing bonding material from the grinding wheel surface and from between the plurality of diamond particles without significant removal of the plurality of diamond particles;

(c) thereafter applying an enhanced lubricity material to the grinding wheel;

(d) thereafter grinding a surface of the silicon part with the rotatable grinding wheel; and

(e) thereafter finishing the ground surface of the silicon part with the one or more grit materials.

2. The method as defined in Claim 1, wherein the silicon part is finished with a plurality of grit materials having substantially different grit sizes.

3. The method of finishing a silicon part as defined in Claim 2, wherein the plurality of grit materials vary from greater than about 200 grit to less than about 800 grit.

4. The method as defined in Claim 1, wherein the silicon part is cooled with a plurality of cooling lines both when grinding the silicon part with the grinding wheel and when finishing the silicon part with the one or more grit materials.

5. The method of finishing a silicon part as defined in Claim 4, further comprising:

changing coolant for grinding another part.

6. The method of finishing a silicon part as defined in Claim 1, wherein the enhanced lubricity material comprises graphite.

7. The method of finishing a silicon part as defined in Claim 1, further comprising:

covering the part while grinding the surface of the part with an overhead cover having a surface area at least four times a maximum nominal diameter of the part.

8. The method of finishing a silicon part as defined in Claim 1, further comprising:

checking the grinding wheel for one or more of a mechanical runnout, a static balance, and a dynamic balance.

9. The method of finishing a silicon part as defined in Claim 1, further comprising:

checking a rotatable spindle for holding the part for vibration.

10. The method of finishing a silicon part as defined in Claim 1, further comprising:

dresssing the grinding wheel to a desired depth.

11. The method of finishing a silicon part as defined in Claim 1, wherein the one or more grit material comprise a plurality of grit materials having a grit variation factor of at least 8.

12. A method of finishing a silicon part using (1) a rotatable grinding wheel having diamond particles and a bonding agent, and (2) a plurality of grit materials, the method comprising:

(a) dressing the rotatable grinding wheel to form a wheel with a grinding surface having a plurality of diamond particles forming a substantially uniform diamond particle grinding diameter;

10 (b) thereafter removing bonding material from the grinding wheel surface and from between the plurality of diamond particles without significant removal of the plurality of diamond particles;

(c) thereafter applying an enhanced lubricity material to the grinding wheel;

15 (d) thereafter grinding a surface of the silicon part with the rotatable grinding wheel while cooling the silicon part with a plurality of cooling lines; and

(e) thereafter finishing the ground surface of the silicon part with the plurality of grit materials having substantially different grit sizes.

13. The method of finishing a silicon part as defined in Claim 12, wherein the plurality of grit materials vary from greater than about 200 grit to less than about 800 grit.

20 14. The method as defined in Claim 12, wherein the silicon part is cooled with a plurality of cooling lines when finishing the silicon part with the plurality of grit materials.

15. The method of finishing a silicon part as defined in Claim 12, further comprising:

covering the part while grinding the surface of the part with an overhead cover having a surface area at least four times a maximum nominal diameter of the part.

16. The method of finishing a silicon part as defined in Claim 12, further comprising:

- 5 checking the grinding wheel for one or more of a mechanical runnout, a static balance, and a dynamic balance.

17. The method of finishing a silicon part as defined in Claim 12, wherein the plurality of grit materials have a grit variation factor of at least 8.

18. A method of finishing a silicon part using (1) a rotatable grinding  
10 wheel having diamond particles and a bonding agent, and (2) one or more grit materials, the method comprising:

(a) dressing the rotatable grinding wheel to form a wheel with a grinding surface having a plurality of diamond particles forming a substantially uniform diamond particle grinding diameter;

15 (b) thereafter removing bonding material from the grinding wheel surface and from between the plurality of diamond particles without significant removal of the plurality of diamond particles;

(c) thereafter applying an enhanced lubricity material to the grinding wheel;

(d) thereafter grinding a surface of the silicon part with the rotatable grinding wheel  
20 while cooling the silicon part with a plurality of cooling lines; and

(e) thereafter finishing the ground surface of the silicon part with the one or more grit materials while cooling the silicon part with a plurality of cooling lines.

19. The method of finishing a silicon part as defined in Claim 18,  
further comprising:

covering the part while grinding the surface of the part with an overhead cover having  
a surface area at least four times a maximum nominal diameter of the part.

5 20. The method of finishing a silicon part as defined in Claim 18, wherein the  
one or more grit material comprise a plurality of grit materials having a grit variation factor  
of at least 8.

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